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ABSTRACT

This paper discusses the parallels between agriculture and education by focusing on genetically engineered seeds in order to demonstrate the master race mentality of success and failure or fertility and death. Although gene technology provides benefits in medicine and related areas, it also carries a big risk which might result in the extinction of higher life forms caused by the sterility of seeding plants. (Contains 23 references.) (YDS)

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The Politics of Seeds and Fertility in Agriculture and Education

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Engineered to Fail?: The Politics of Seeds and Fertility in Agriculture and Education

Emily DeMoor and Michelle Haj-Broussard

The universe began as a singularity – a seed of potentiality from which all life emerged. A child begins as a seed within its mother's womb, which, like that of a plant, carries within it the potentiality of a fully-developed organism. The story of the seed and of human potential are closely aligned as the designers of "terminator" technology genetically engineer the fatal human flaw of self-destruction into the natural world. In this paper we will draw parallels between agriculture and education in order to demonstrate how both are driven by a master race mentality whereby success and failure, fertility and death, are engineered. To that end we will look at the agricultural issues of seeds, genetically modified organisms, control, monopoly, and diversity with an eye to discerning how the underlying values of industrial agriculture are also played out in the politics of the classroom. For the themes of power, diversity and fertility find a corollary in education, raising questions as to whose stomachs and minds get filled, whose lives and futures are viable, who triumphs, who fails, and who is engineered for self-destruction. Whose language is spoken, whose stories are told, and whose are aborted? What toxins are masterminded into the educational system and when and how are they activated in the life cycle of the child? What are the hidden risks of a monocultural approach to education? In this essay we will look at these important questions, placing agriculture, ecology, curriculum theory and educational praxis, especially in the area of language, in dialogue. Drawing upon the work of Swartz & Olgilvy, William Doll, and Frederick Ferre', we will suggest ways

to counteract a dangerous ideology of colonization and create an alternate, life-giving path, by looking to the functioning of living systems.

Monsanto Corp. currently owns the patent on a process whereby seeds are genetically engineered to kill their own seeds in the second generation, making it impossible for farmers to save and replant them, thereby increasing the value of Proprietary seed owned by U.S. seed companies. The genetic components of this process are a gene for a toxin that will kill the seed, a promoter sequence that activates the toxin during the late stages of seed maturation, and a third gene that produces a suppressor to keep the toxin turned off until it is exposed to an outside stimulus (Bruce 2000). Use of this technology, which has, for the present, been banned in the U.S., would create a monopoly that could have a devastating effect on the Third World and on poorer farmers in the U.S., for half of the world's farmers are poor and can't afford to buy seed every season, yet poor farmers grow 15-20% of the world's food, directly feeding at least 1.4 billion people (Shand and Mooney 1998).

While there may be potential benefits to some forms of gene technology, especially in the area of medicine, there are arguably more dangers than benefits to genetically engineered crops. These include the hidden risks involved in moving genes across species lines, ecological risks including crop diseases resulting from developing new monocultures, potential problems of disease resistance and vulnerability, and possible health risks to farm workers or consumers (Lappe and Bailey 1998). The greatest risk, according to Geri Guidetti of the Ark Institute, is the possibility of the gradual spread of sterility in seeding plants, resulting in a global catastrophe that could eventually wipe out higher life forms from the planet, including humans (Guidetti 1998).

Martha L. Crouch, of Indiana University, has confirmed Guidetti's fear, publishing a series of papers specifying how the resulting castrated plants will be able to sterilize nearby normal species via their pollen, passing the toxin gene to other plant species through cross-pollination (www.bio.indiana.edu/people/terminator.html).

The recent terrorist attacks of September 11 on New York City and Washington, D.C. provide a poignant example of suicide technology on a massive and horrendous scale. The world watched in shock as humans inside of hijacked planes became living weapons against themselves in a sick parody of the terminator seed. Although one tends to see such despicable behavior as characteristic of the "Other" evil ones outside of the U.S., perhaps this unthinkable act mirrors some of the widespread and hidden psychic forces present in modern culture, now unleashed in a graphic display that can no longer be ignored.

Three days after the tragedy we watched the television news with alarm as a parade of young school children marched along the streets of New Orleans. For there was a gradual shift of posture and tone when the singing of "God Bless America" mutated into a militant chant. Gently waving flags now stabbed the air to punctuate the rhythms of a heavy-footed march. An inner toxin had been activated. A mother listened with equal horror as her teenage son told of his teacher's admonition to his class that those who can't get their homework assignments right will be the first to be drafted.

Will our children become soldiers, our plows become swords, in a global war of humanity against itself? Must we, in order to be good citizens, support the cause of war and thus become complicit in it? Must we become something we are not – something abhorrent to ourselves? Must we adopt the terminator seed mentality and sacrifice our

offspring to support the very colonialist ideology that we fear? When we act against our nature, we create war within ourselves. When we act against the natural world, we create war with the entire family of life.[1]

Botanist J. Folsom writes,

> Civilization is the story of grains: wheat, rye, rice, corn, barley, and oats. It has turned on the value of spices and other exotic plant products, goods that fired the engines of imperialism. Sugar cane and cotton demanded the toll of slavery. Tall, white pines masted British ships and stoked a revolution. Tea and opium led to wars and addictions...(Folsom 2000, unnumbered pages).

We suggest that terminator seed technology is a manifestation of a deadly colonial mindset. Imperialism turned human aggression outward to conquer the Other. Genetically modified organisms reflect the human now turning inward to subdue the inner life forces of the earth as we recreate the seed in our own image as conqueror.

Miriam Therese MacGillis (1993) of Genesis Farm maintains that a great shift of consciousness is required to transform agriculture as it is practiced in the industrialized world. She explains that the propensity toward favoritism has led to monoculture, which is now reducing biodiversity and damaging the land. MacGillis maintains that the feeling of being doomed to earn our bread by labor and sweat, generated by a literal reading of Genesis 2, is part of a deep, hidden rage against the natural world. She explains,

> The determination to redeem the Earth and transcend its natural limitations has played itself out in the industrialization and total mechanization of farming. The soils have been exhausted and drugged, their inner life forces deleted and

[1] The previous three paragraphs reflect the experiences of Emily DeMoor only. The "we" is rhetorical

> poisoned, not because we are necessarily an evil species so much as that we are driven by our abstract ideas about a perfect world. (MacGillis 1993, p. 163).

Like agribusiness, education is often engineered, driven by an underlying system management procedure as mapped out Michael Apple in his work Ideology and Curriculum (1979, 1990).

> The problems of schooling are to be solved by 'modest inputs of centralized administration, along with expert services, research and advice.' The lack of quality in education is viewed in terms of only a lack of technical sophistication and can be effectively solved through engineering. (p.112)

The educational system's reduction of diversity and move towards a centralized monoculture is particularly evident with regards to the valued language/dialect of Standard English. According to Crawford (1998), the languages of minority students are seen as social liabilities, such as limited proficiency in the majority tongue and its academic consequences: Language-as-problem. This follows what is known as the cultural deficiency explanation for minority students' failures. Lewis (1966, cited in Valdés, 1997) believed that in order for children to succeed in school, their many deficiencies need to be corrected and they must learn to behave in a more traditional mainstream fashion. He believed that children could overcome their deficiencies and learn "proper" behavior in specially designed intervention classes.

Not only are students who diverge from the monoculture seen as "problems", they are also seen and see themselves, as often found in a colonial mind-set, as 'dirty.' Paulo Freire in Pedagogy of the Oppressed (1993) reiterates this idea when he describes a member of the in-group of 'pure' men (sic) as "the owners of truth and knowledge, for

whom all non-members are 'these people' or the 'great unwashed'." An example of this is recounted by MacGregor-Mendoza's (1999) in her presentation at the First Heritage Language Conference. MacGregor-Mendoza relates Cruzita S.' experiences:

> Lady Y recalls another incident in second grade, Her teacher, who was Hispanic, also washed Lady Y's mouth with soup for speaking Spanish. Lady Y thought that this lady would be understanding considering that she was Hispanic.

This punishment for diverging from the valued monoculture, echoed by other students whose language or dialect differs from Standard English, is sometime inflicted by adults who share the students' culture and language. "One of the characteristics of oppressive cultural action which is almost never perceived by the dedicated but naïve professionals who are involved is the emphasis on a focalized view of problems rather than on seeing them as dimensions of a totality" (Friere, 1993, p 122). Hispanic teachers who washed out students' mouths with soap, Cajun parents who refused to include their children in French of any kind, believed that for the children to succeed they would need only English. They felt that eliminating the marginal language could lift oppressive conditions. They did not see the whole picture. They did not see that they were trying to destroy the foundation on which they themselves had constructed their identity and that, subsequently, the children of their culture would be left trying to construct their identity on "white-washed" rubble.

In Naturalistic Inquiry, Lincoln and Guba (1985) present the Schwartz and Ogilvy "New" Paradigm for educational research, which is based on the functioning of an ecosystem. According to this paradigm, knowledge requires that one engage with a system or organism in its environment, which is its meaning-defining context. The need

for contextualization of research, knowledge, and learning is vividly illustrated by the land-based Dreaming Songs of the Australian Aborigines. In The Spell of the Sensuous David Abram (1996) explains that the language of the Aborigines is inseparable from song and story as the chanting of song cycles link the singer to the flora, fauna or powers within the land. The Dreaming songs function in multiple ways as they orally recall viable routes through difficult terrain, provide codes of behavior for the community and activate the memories of stories, intertwining earthly places with linguistic memory. The narratives respond directly to the land and, Abram suggests, the land to them. When these stories are removed from walking the land itself and committed to words on a page, the Dreaming power of these ancient stories is diminished (Abram 1996, p. 177).

Abram maintains that the coherence of human language cannot be separated from the coherence of the surrounding ecology without doing violence to both. He applies the term "cultural genocide" to the destitution of indigenous, oral peoples who have been forcibly displaced from their traditional lands. For them, the local earth is "the very matrix of discursive meaning." To force them from their native land is to render them speechless or their speech meaningless; "to dislodge them from the very ground of coherence" (Abram 1996, p. 178).

The interconnectedness of the student to the context which surrounds them is underlined in Lisa Delpit's (1995) advice to teachers on "appreciating linguistic diversity in the classroom". Delpit understands the importance of Standard English to the economic success of students but she states that "First, they [teachers] should recognize that the linguistic form a student brings to school is intimately connected with loved ones, community, and personal identity (p53)." Delpit further underlines the importance of a

pluralistic, holistic education when she discusses how the North Solomans people wanted not only an education that would prepare their children for the modern world but "they wanted 'what was good from the old' so as to have children feel the security of a strong cultural base (p.87)." Delpit and the North Solomans people understood that detaching a child from their culture and/or their language is tantamount to " killing their own seeds." A child does not blossom in an environment sterilized of all that came before.

We suggest that to a monocultural approach to language, or any aspect of education, supports Abram's notion of cultural genocide. Environmental scientist Frank B. Golley (1998) reminds us that diversity is a measure of the vigor, health, productivity and beauty of an ecosystem (1998, p. 106). Aldo Leopold proposed that action is right when it maintains the stability and integrity of the biotic community (in Golley, 1998, p. 106). Nature teaches us that monopoly is not viable, as evidenced by the Irish potato famine of 1845-46 - a catastrophe that could have been averted had more than one variety of potato been planted, increasing the odds of disease resistance in the food supply. In articulating the principle of competitive exclusion, G. E. Gause (1934) provided another argument against monoculture. Gause espoused that two species cannot share the same niche or do exactly the same thing. If they do not interact with the niche in differing ways, they will compete and one will dominate and replace the other (in Golley 1998, p. 189). The human is a part of the life systems of the earth and thus subject to the same principles and dynamics.

In Ecological Education in Action Smith and Williams (1999) propose that educators develop ideas and models that reconceptualize both the relationship between education and the environment and the purpose of education itself (Smith and Williams

1999). Schwartz and Ogilvy provide insight into how this might take shape when they offer the metaphor of the pond, with its traceries of ripples, as a basis for doing educational research. They suggest a change in metaphor from reality as a machine toward reality as a conscious organism that is complex and unpredictable (in Lincoln and Guba 1985). Swartz and Ogilvy's work is indicative of an emergent educational paradigm that moves away from a mechanistic view of nature and toward a living systems model.

In *Being and Value Toward a Postmodern Metaphysics*, Frederick Ferre' (1996) outlines a metaphysical position that is resonant with the Smith-Ogilvy ecological model; one that he believes is capable of "grounding a postmodern worldview which is attuned to and makes sense of the urgent values of many who are in search of a postmodern world" (Ferre' 1996, p. 307). According to Ferre', postmodern metaphysics needs to address the application of an ecological model of thinking in terms of complexity, relationship, and interconnectedness; "In place of individuals in competition we are invited see networks in community" (Ferre' 1996, p. 316). Ferre' proposes ecosystem ecology as the leading postmodern science, dealing with entities from both their outer and inner manifestations and dynamics.

Ferre' maintains that ecology fosters post-modern value preferences for qualitative uniqueness, personal integrity, moral responsibility, social justice, essential relatedness, and holistic attitudes toward nature (Ferre' 1996, p. 307). Honoring diversity, pluralism, and respect for otherness, ecology necessitates long time spans rather than quick payoffs and interdisciplinarity and teamwork rather than specialization and

competition (p. 312). Ecology is also characterized by indeterminacy, or to use Golley's phrase, "a dynamic response system" (1993, p. 196).

In outlining the underlying values of an ecosystem, Ferre' provides effective arguments against a terminator mentality in both agriculture and education. He asserts, "the process of an entity's *coming to be something definite* can be equated with the *generation of intrinsic value* for the entity concerned (italics are his). On an external level, this is a process by which an entity becomes a concrete actuality from a larger range of possibilities "in the moment of its energetic pulse;" on an internal level, it is "the triumph of specific character over mere prospect" and "the satisfaction of contributing some definite inheritance to the future" (Ferre' 1996, p. 357).

The process of becoming is central to William Doll's (1993) post-modern curriculum theory. Drawing upon living systems theory and the open or process thought of Jerome Bruner, John Dewey, Jean Piaget, and Alfred North Whitehead, Doll develops a curricular perspective that recognizes human beings as living systems and thus open systems. Educational development, he maintains, most successfully occurs when based on "the type of system that characterizes being human" (Doll 1993, p. 58). Doll asserts that, rather than paying attention to the complexity of human thought, curriculum theory has adopted a behaviorist paradigm. In his view, this contributes to a notion of curriculum "where training in pre-chosen activities has superseded the development of transformative abilities" that allow us to go beyond mere information. He proposes the recognition of purposiveness, self-organization and communication as part of a post-modern educational paradigm.

Terminator technology is a manifestation of the Newtonian mechanistic worldview taken to its furthest extent. Being inorganic, this worldview has "no view of growth and a most limited view of interaction" (Doll 1993, p. 63). Self-organization and purposive coming-to-be are aborted. Citing the work of Piaget, Doll advocates an open, biologically oriented model that sees humans and their learning process as allied with self-organizing, living systems (1993, p. 64). In living systems new structures emerge "spontaneously, self-generatively, unpredictably from the old ones," and give birth to the "not-yet-conscious" (Doll 1993, p. 66). In terms of curriculum, Doll suggests that teachers need to assess not only what performances and operations have been learned, but "what structures are in the embryonic stage of development ready to burst forth at a later time..." (1993, p. 67). Borrowing from Birch and Cobb (1981), he proposes that development is "an ecological succession in which one stage prepares for and initiates the next" (Doll 1993, p. 25).

Doll's reference to the embryonic developmental stage brings us back to the image of the seed. In contrast to the terminator seed mentality, we offer the image of the heirloom seed as one that embodies a living systems or ecological orientation. Predating the rise of modern agriculture, heirloom seeds are not chemically treated nor genetically engineered. A part of cultural history, they represent the stories of the indigenous peoples of this continent and the immigrants who brought them to America from their homelands. Kenny Ausubel (2002), of Seeds of Change, explains, "A seed is not just a seed... It represents all the knowledge that went into it--how the people planted it, what songs they sang, what prayers they offered." Heirloom seeds are successfully adapted to particular regions, having strong characteristics of taste, texture, appearance, disease and

pest resistance. A repository of diverse genetic types, they are important to biodiversity. They are open-pollinated, which allows their genes to stabilize over many generations and creates reliable characteristics, allowing them to cross-pollinate in the future and be saved or replanted. We suggest, then, that heirloom seeds go beyond sustainability to engender a sense of an ever-emergent future.

Like Doll, who pushes the educational endeavor beyond knowledge acquisition to transformation, Ferre' moves from a discussion of ecological systems to the creation of beauty. Acknowledging the subjective aspect of an entity in its moment of actualizing, Ferre' rejects the modern myth of inert, passive objectivity. He proposes, instead, a vision of an energetic universe in which each entity is dynamic, vibratory, unique and intrinsically valuable. All entities are related, combining to create rich and interesting harmonies; "to achieve subjective harmony is to generate beauty" (Ferre' 1996, p. 357-358). In this way, Ferre's ecological post-modern metaphysics becomes an aesthetic philosophy, which he calls "kalogenesis," or the generation of beauty. He suggests that "...in its process of becoming actual every fundamental entity must result in a unified harmony of definite elements held together in experience. In this way, every pulse of actualizing energy represents in itself an act of kalogenesis...every pulsing element of our kosmos is beautiful to some degree in itself and for itself" (Ferre' 1996, p. 358). In terms of human experience, the dynamic of kalogenesis is present in all conscious experience, including love, morality, religion and the pursuit of knowledge (p. 363).

An oganismic metaphysical and institutional framework, in Ferre's view, will aim at optimization rather than maximization, for bigger is not always better for an organism, and more is not always a healthy goal. This thinking, he believes, will also lead to more

technologies of cultivation and fewer of manipulation and will embody technologies of differentiation rather than centralization (Ferre 1995, p. 134). Ferre's ideal, however, is in contrast to the reality that one may encounter in the classroom.

Michael Apple finds that students, in this age of accountability, are not intrinsically valued. Rather, their value is determined "according to their 'ability' and their possession of particular kinds of cultural capital" (Apple, 1990/1979). Sacks (1999) gives anecdotal evidence of this value in discussing Jason. Jason had "achieved a status of minor celebrity at his grade school" and " his teachers' adored him because his scores... put him in the ninety-ninth percentile." His mother complained that the teachers "didn't see him. They saw his test scores" (p. 65). With accountability being determined almost exclusively by test scores – in Louisiana 90% of a school's performance score is based on standardized test scores -- and with punitive measures for schools and districts based on accountability performance, the process of seeing and valuing students according to their test scores will no doubt increase.

Moreover, the pursuit of knowledge in the educational system has little to do with "kalogenesis," achieving subjective harmony, or generating beauty. Rather, "the guiding principals that we use to plan, order and evaluate our activity—conceptions of achievement, of success and failure, of good and bad students—are social and economic constructs" and play a role in "the cultural and economic reproduction of class relations" in our schools (Apple, 1990, p. 130). This system of intellectual engineering, like the genetic engineering of Monsanto's "terminator" seeds, determines which students possess the characteristic traits to succeed and blossom and which students will self-destruct, in terms of self-esteem, or the acquisition of knowledge and skills with which to participate

in the lifestyle and economy of the dominant culture. From Willis' (1981) working class English boys to Foley's (1990) "shit-kickers" and "vatos" (lower-class white and Latino) and finally to MacLeod's (1995) "Hallway Hangers" (low-income whites) and the "Brothers"(low-income African-Americans), the children that diverge from the monoculture of school are numerous and plentiful.

In this essay we have looked at the implications of a colonialist mentality, as manifested in agriculture and education, and have explored the possibility of an ecological or living systems approach, as embodied in the heirloom seed. Botanist Jim Bruce asks, "What will be the effect of seeds which no longer participate in the cycle of life but rather in a spiral of death?" (2001). The same could be asked of the effect of children who no longer participate in the cycle of life, but rather in what Langston Hughes identifies as "a dream deferred." The politics of seeds, fertility, food, and education may become an increasingly deadly game as the world's population doubles over the next forty years. It is vitally important that our educational practices safeguard the inner life forces of the child, for they are truly the seeds of our human future. Rachel Carson, in Silent Spring, the watershed work of 1965 that gave birth to the ecological movement, suggested the possibility of a springtime devoid of the sound of bird songs. If the master crop/master race ideology that drives agribusiness and filters into our classrooms continues to propagate unchecked, we will have no "silent spring." We will have no spring at all.

Education is, however, by its nature, a hopeful endeavor, and the natural world of which we are a part is designed not only to thrive, but to manifest transformation and beauty. Drawing upon its life systems and processes as a source of curriculum and

pedagogy, then, is most surely a promising course of action. Let us ponder this -- What are the heirlooms that can unsilence our springs, and our children, and restore the balance?

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